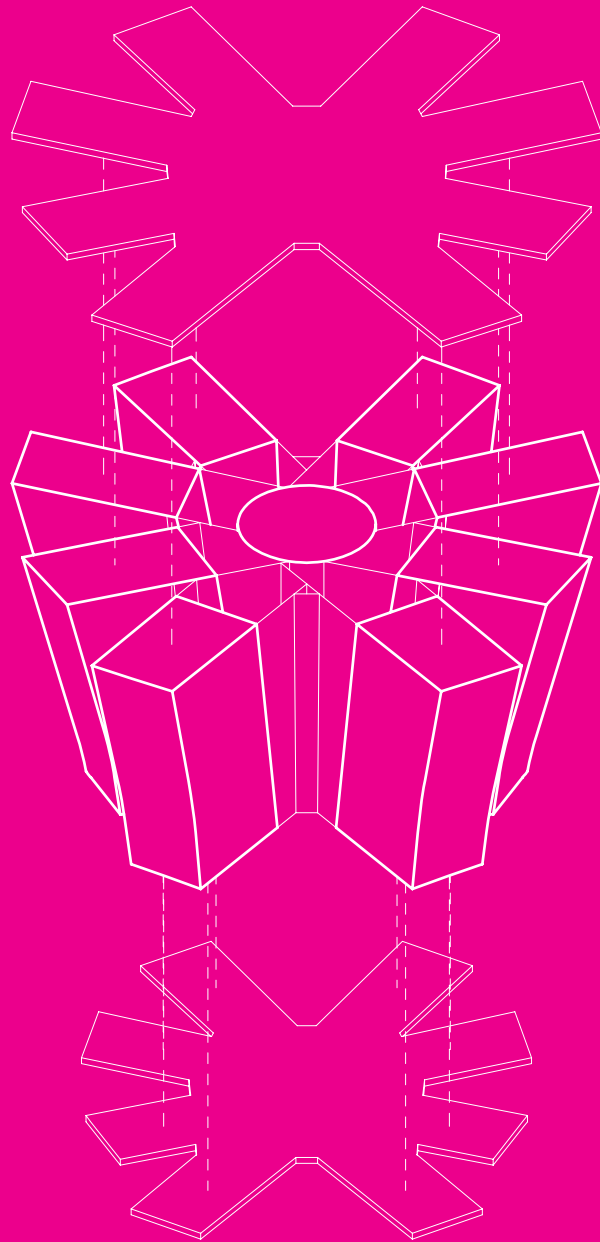


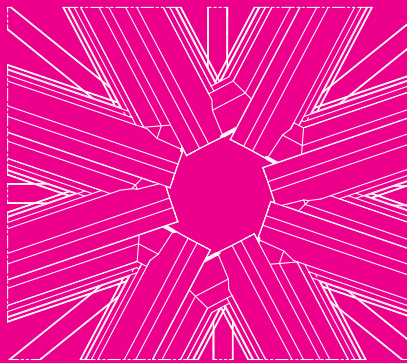


**SPORT &  
ENTERTAINMENT**

**BURO HAPPOLD**



**BURO HAPPOLD**



- 1 Introduction
- 2 Arenas
- 3 Stadia
- 4 Venue Expansions
- 5 Major Events



# INTRODUCTION

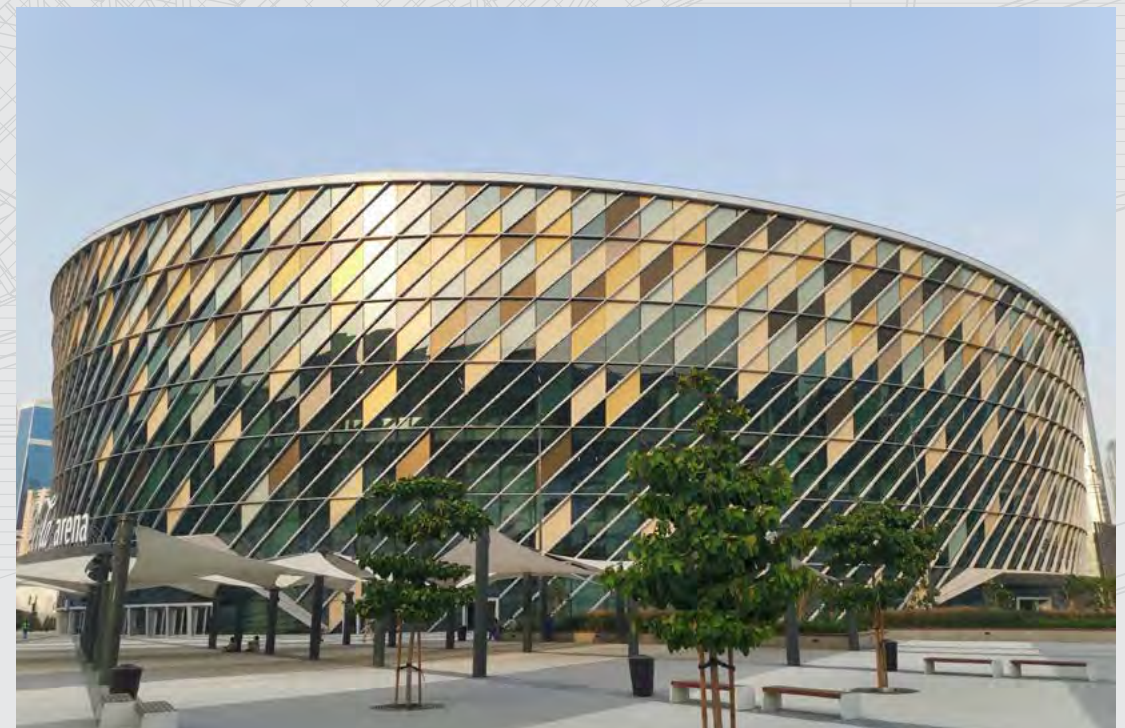
Our leisure choices have never been better. More matches. More concerts. More fun. How can your venue win in this highly competitive environment? By offering something special for everyone, from fans, artists and athletes through to operators, owners and the community.

Buro Happold is a world-class engineering and consultancy practice. We work collaboratively to deliver outcome-focused solutions for the sport and entertainment industry.

Clients benefit from our dedication to completing stadium and arena projects that succeed both creatively and economically. Offering integrated engineering design together with consultancy on the built environment, we believe that venues can be the catalyst for sustainable development and regeneration of an area. Upon gaining a full understanding of the operational requirements and fan expectations, we strive to develop a unique facility that maximises returns.

Our approach is supported by an in-depth knowledge of a venue's needs, which covers every aspect from design to handover. Buro Happold's technical specialists work together to provide a single coherent solution that enhances the experience for all.

With an expansive portfolio, Buro Happold takes great pride in our ability to create venues for some of the most demanding and exciting events in the world. Whatever the challenge, as a multidisciplinary team we have the expertise to meet it.





TIMELINE

2005

OVAL LINGOTTO  
TURIN, ITALY



2007

THE O<sub>2</sub> ARENA  
LONDON, UK



2006

EMIRATES STADIUM  
LONDON, UK



2008

ASTANA ARENA  
NUR-SULTAN,  
KAZAKHSTAN



2009

ZAYED SPORTS  
CITY STADIUM  
ABU DHABI, UAE



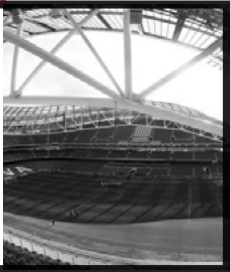
2011

SILVERSTONE  
RACETRACK  
NORTHANTS, UK



2010

AVIVA STADIUM  
DUBLIN, IRELAND



2012

LONDON 2012 OLYMPIC  
STADIUM, LONDON, UK



2013

PHILIPPINE ARENA,  
BULACAN, PHILIPPINES



2014

FISHT OLYMPIC  
STADIUM  
SOCHI, RUSSIA



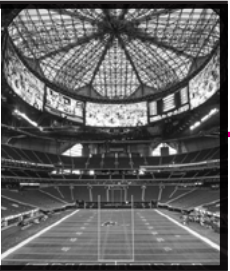
2015

OLYMPIC STADIUM  
TRANSFORMATION  
LONDON, UK



2017

MERCEDES-BENZ  
STADIUM  
ATLANTA, USA



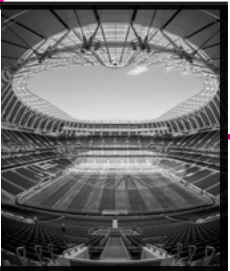
2016

ETIHAD STADIUM  
EXPANSION  
MANCHESTER, UK



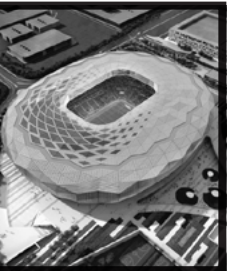
2018

TOTTENHAM HOTSPUR  
STADIUM  
LONDON, UK



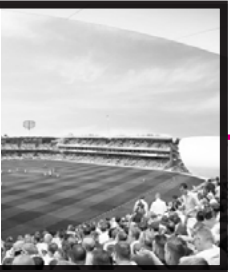
2019

EDUCATION CITY  
STADIUM  
DOHA, QATAR



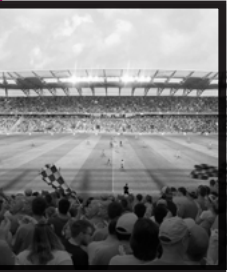
2021

LORD'S CRICKET  
GROUND  
LONDON, UK

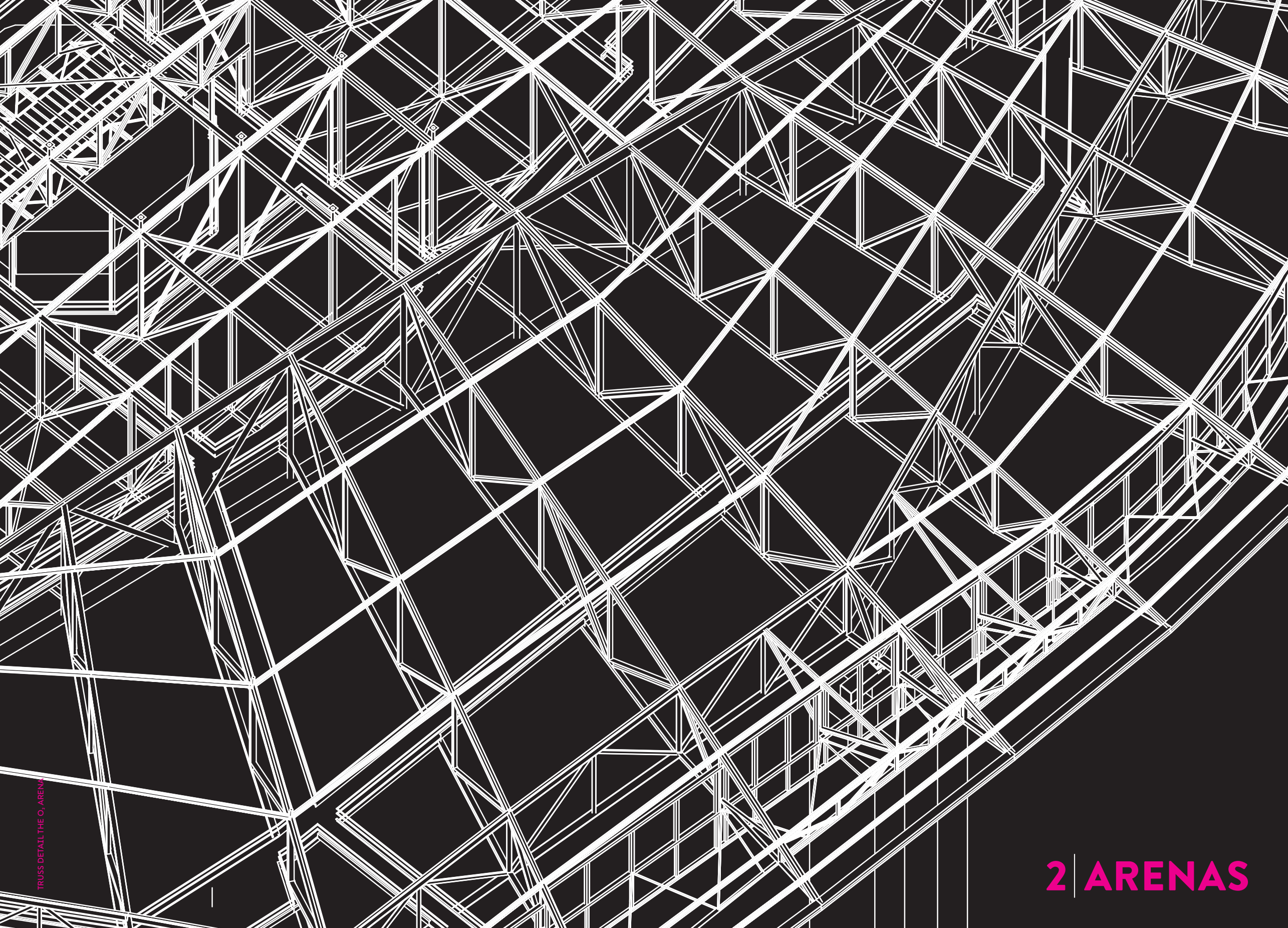


2020

WEST END  
STADIUM  
CINCINNATI, USA









# ARENAS

When it comes to creating a successful arena, versatility counts. At the very top of the market, great arenas become exceptional by offering a space that is not only adaptable but also retains the venue's unique character, whatever the event.

Buro Happold's engineers provide state-of-the-art design solutions for landmark arenas all over the world. We have worked diligently to develop a track record for creative thinking, reliable delivery and outstanding customer care. At the start of every project, our team discerns exactly what the developer and operator want to achieve. A detailed knowledge of how existing venues best serve a variety of specifications then informs how we meet a new arena's requirements.

Whether it be sport, music, a convention or an expo, we can make a multiuse facility work perfectly for a broad range of activities.

Effective design is underpinned by a thorough understanding of operational needs along with what constitutes a memorable user experience. By striking a winning balance between these two drivers, we help clients to create landmark arenas that are flexible, popular and profitable.









The O<sub>2</sub> sits within the former Millennium Dome, one of Buro Happold's most prestigious projects of the 1990s. Versatility of use is a major part of the arena's success. In addition to hosting concerts, the space can be transformed to host a range of sports ranging from boxing to ice hockey; artistic gymnastics, trampoline, basketball and the wheelchair basketball event all took place here as part of the 2012 Summer Olympics and Paralympics.

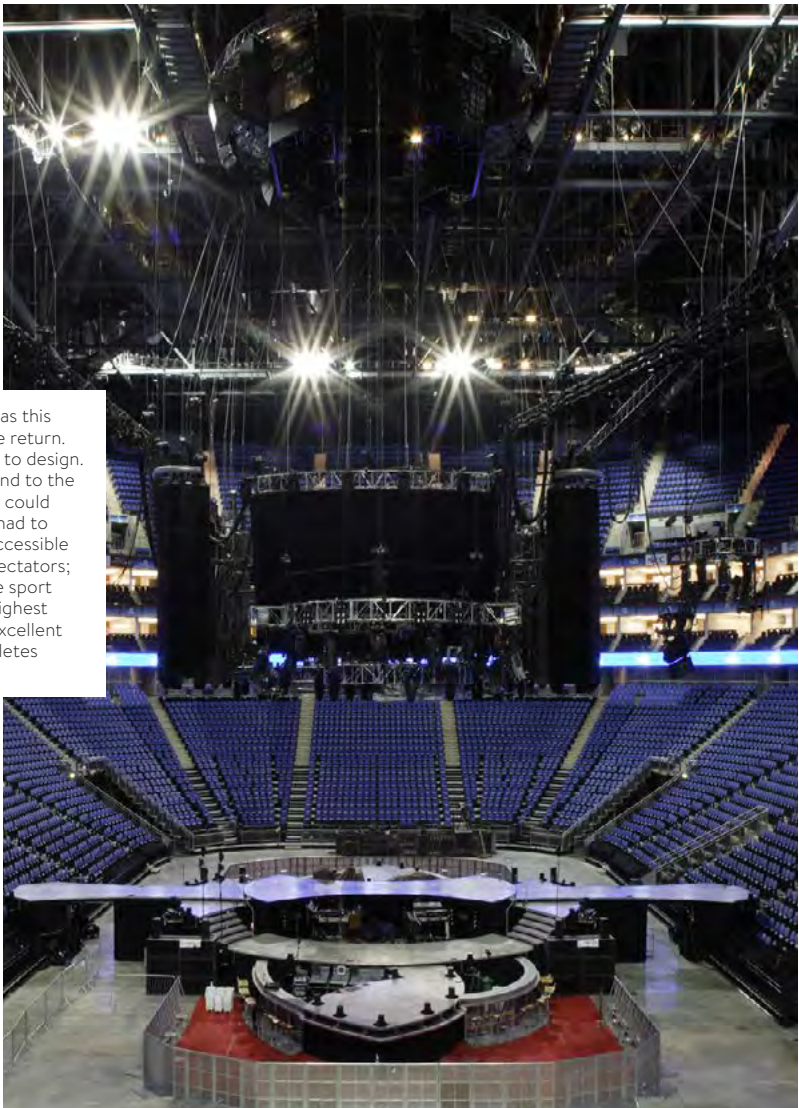
ARENAS

ARENAS





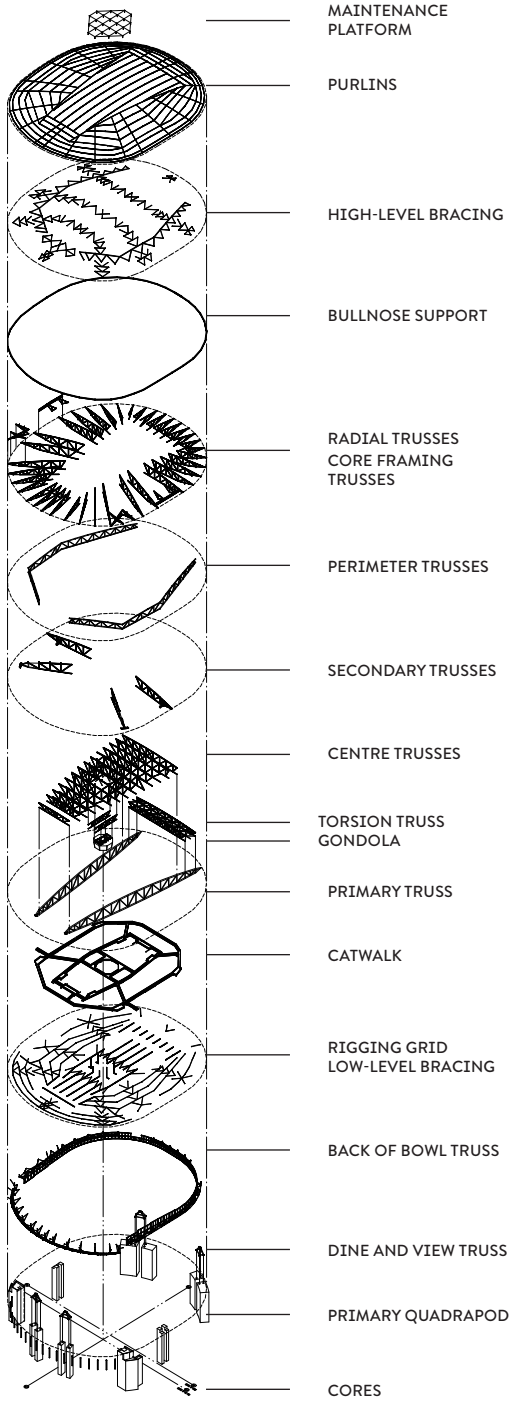
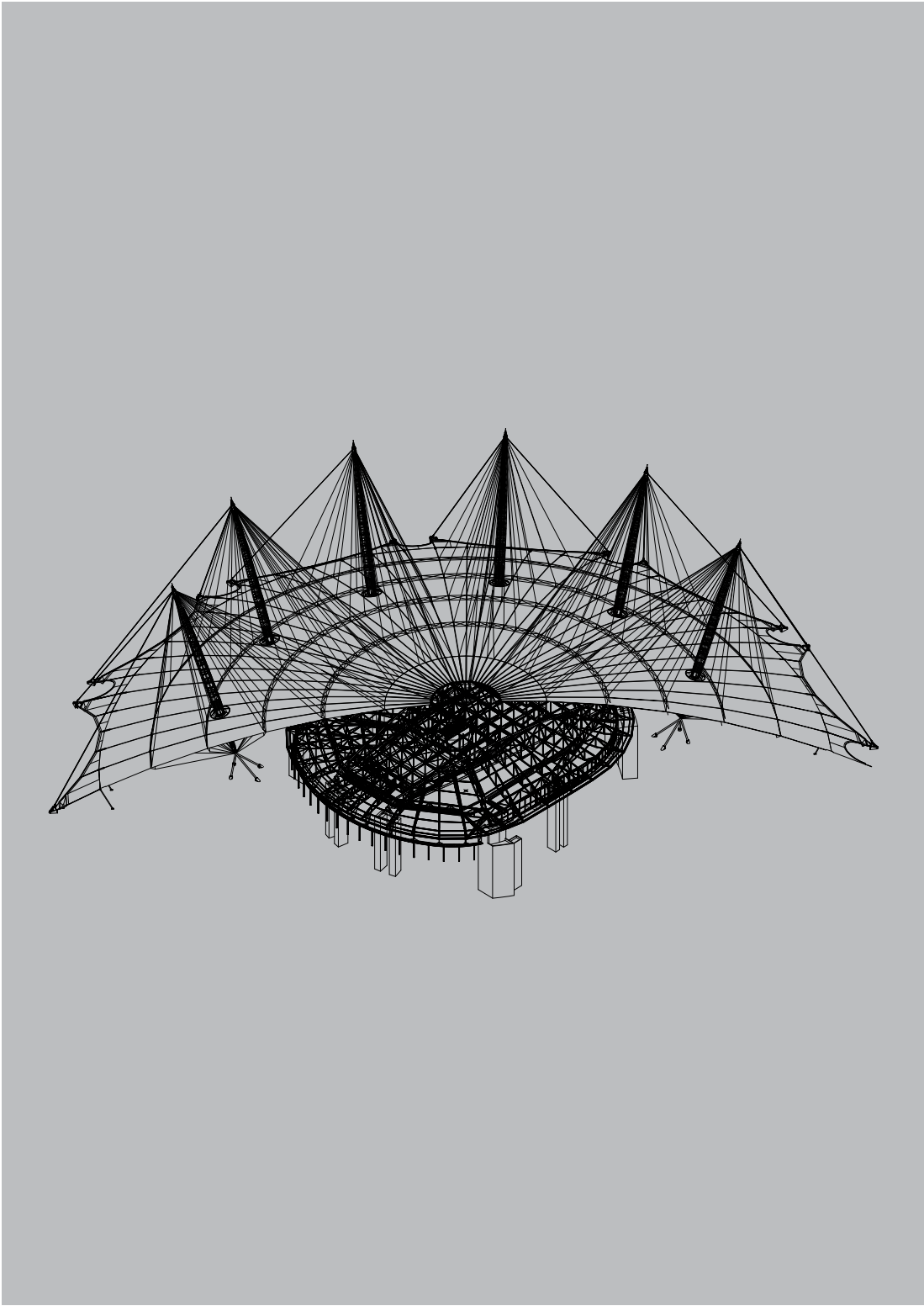
The O<sub>2</sub> Arena opened in 2007. This 23,000-seat multipurpose venue has delivered a performance that is nothing short of spectacular ever since. Designed to be the most technically and acoustically advanced arena in Europe, it has become one of the most popular venues for artists, comedians, sports stars and spectators in the entire world.



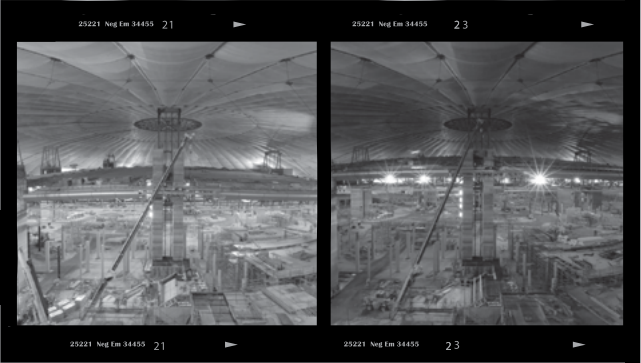
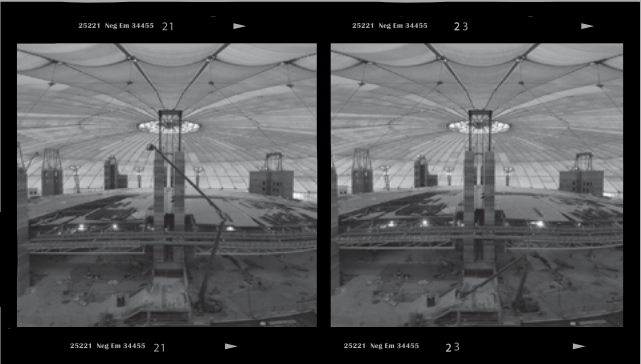
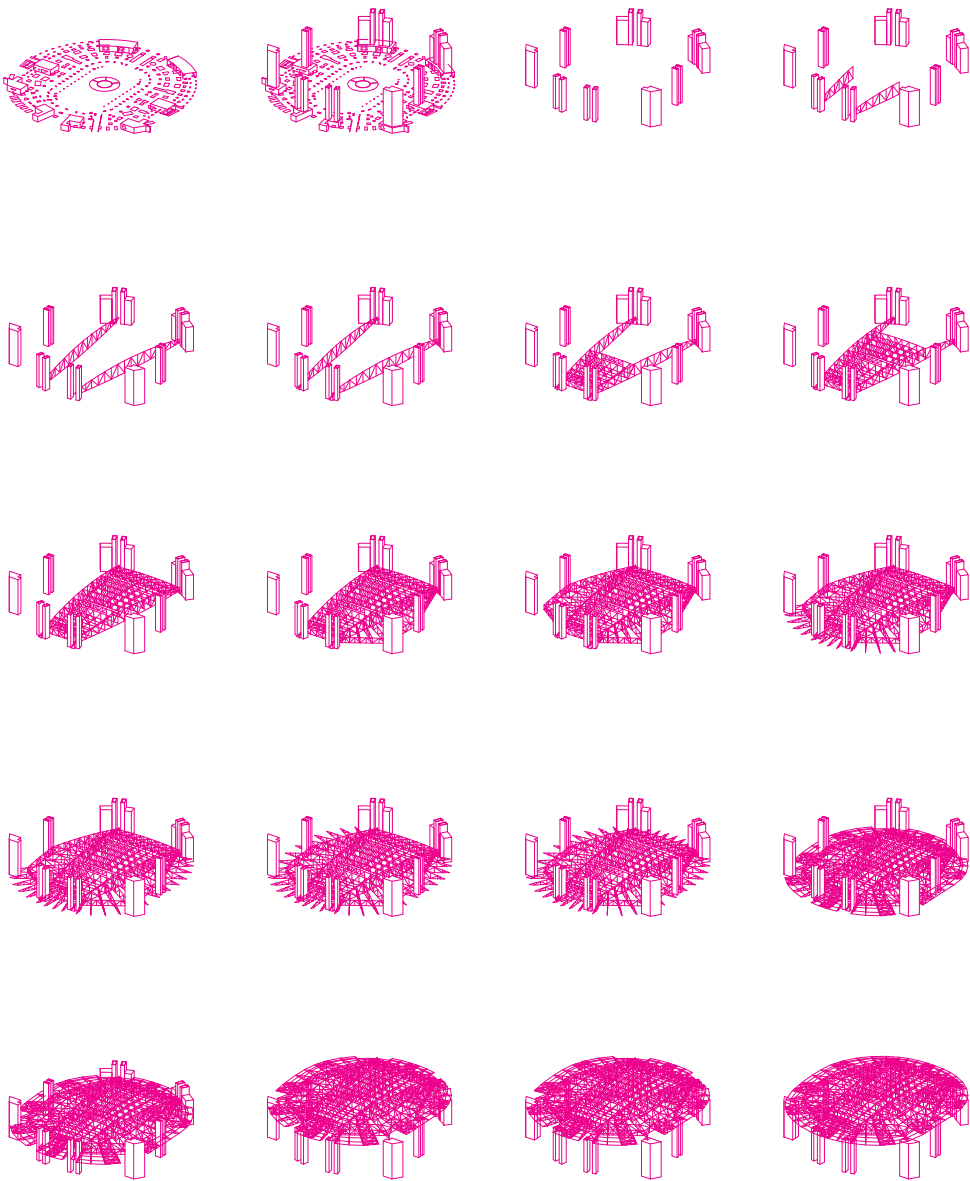
An adaptable building such as this must work hard to maximise return. Consequently, it is not easy to design. The venue needed to respond to the broadest of briefs so that it could be truly multifunctional. It had to be safe, comfortable and accessible for tens of thousands of spectators; it also had to accommodate sport and entertainment to the highest standards while providing excellent facilities to attract elite athletes and performers.







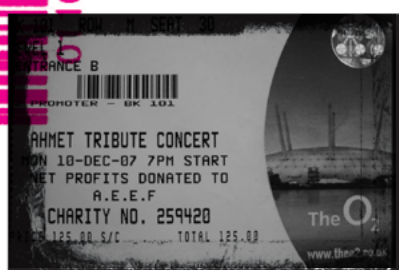
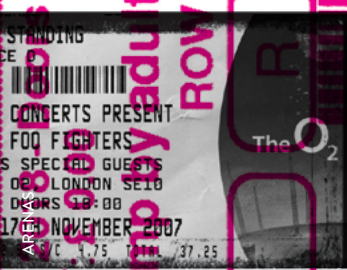
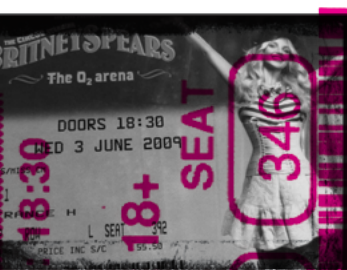
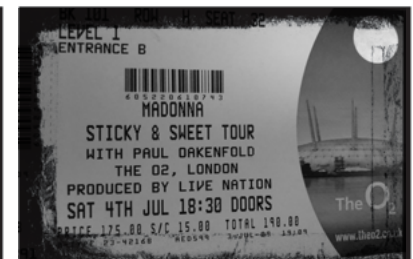
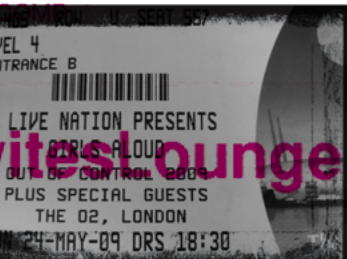
Our early work focused on the design and construction of the roof. This was prefabricated in situ on the floor of the Dome before being jacked into place without the use of cranes. Having completed the supporting structure below, a specialist cladding was attached to the roof to create optimum acoustic performance throughout the enclosed space. Although this was a heavy and complex component to install, the improvement was considered worth the investment. Such fastidiousness highlights our attention to detail in devising the best possible design solutions for all aspects of a project. This has led to success for the client.



The O<sub>2</sub> Arena is a stunning venue with a special and unique design. The construction and lifting of the roof by controlled strand jacking of the whole 4,400-ton assembly was skilfully and safely achieved to a tight schedule, despite the challenges of construction within an existing building.







**Saturday, 11 August**  
**TICKET**  
**Under 15s accompany adult 18+**  
**ENTRANCE BLOCK**  
**B 111**  
**HOUSECOMP**  
ORDER NUMBER: 026-0484 2504  
[111,R346] #24/50

The O<sub>2</sub> Arena is unquestionably the world's most successful music and entertainment venue. Ever since 2008, annual ticket sales have exceeded two million. On 24 June 2007, Bon Jovi were the first band slated to appear before a paying audience. Subsequently, this has become a must-book destination for the industry's biggest names including the Rolling Stones, Jay-Z and Lady Gaga: this is the place where Prince put on 21 nights, Led Zeppelin reformed and the Spice Girls sold out a single date in a record-breaking 38 seconds. Nickelback have played there too.

Away from music, comedy fans have enjoyed everyone from Monty Python to Miranda Hart at the O<sub>2</sub>. For sport enthusiasts, the first NBA league game played outside the US was held at the arena in 2011, while the tennis season has reached a gripping conclusion here with the ATP World Tour Finals since 2009. UFC, darts and the FIFA eWorld Cup Final have also featured on the venue's wide-ranging programme.



ARENAS





22

▶ 9



#### SAP GARDEN, MUNICH, GERMANY

The multifunctional SAP Garden will be the new home for the Red Bull München ice hockey team and FC Bayern München Basketball. Located on the site of the former velodrome in the Munich Olympic Park, it will have a capacity of up to 11,000 seated guests. The design of the arena, enhanced by a green roof and vertical facade structure, blends into the world-famous Olympic Park.



23

▶ 10



#### 3ARENA, DUBLIN, IRELAND

Situated in the Dublin Docklands, 3Arena provides world-class concert and venue facilities for Ireland's capital city. Designed by architects Populous, this major redevelopment has increased capacity to 14,000 in concert mode, providing better sightlines and acoustics while upgrading the front and back of house facilities to modern international standards.





#### PINNACLE BANK ARENA, LINCOLN, USA

Not only home to the University of Nebraska basketball teams but also a general entertainment venue, the Pinnacle Bank Arena is a multiuse facility located in Lincoln. The 15,200-seat arena is found in the thriving West Haymarket district, a short walk from the main university campus. The homes of Nebraska Cornhusker football and baseball teams are also nearby, so the new arena is completing an exciting entertainment zone.



#### ECHO ARENA, LIVERPOOL, UK

The development provides a 10,000-seat arena, which consists of a conference centre incorporating a 1,350 seat auditorium, a 7,500m<sup>2</sup> exhibition facility and a versatile hall. The facilities offer maximum flexibility, allowing rapid transformation and are supported by a multi-storey car park and a major new public piazza.



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#### PHILIPPINE ARENA, BULACAN, PHILIPPINES

The Philippine Arena is the largest indoor entertainment venue in the world. Designed to shelter up to 55,000 spectators and 5,000 performers from severe climactic and seismic conditions, this energy-efficient venue it is among the top five most earthquake-resistant structures in the world.

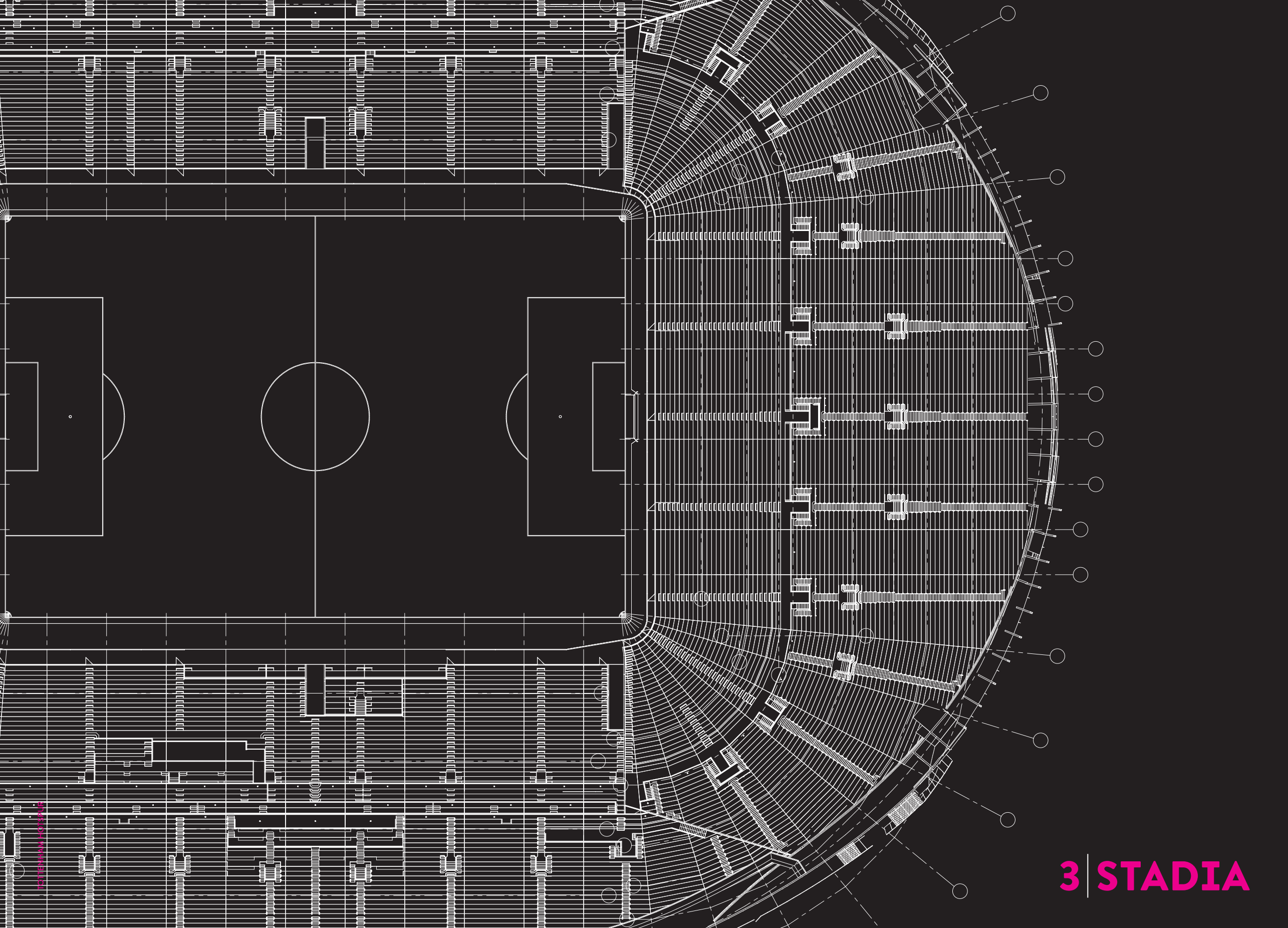
27



#### COCA-COLA ARENA, DUBAI, UAE

The Coca-Cola Arena is a 17,000-capacity indoor venue that can accommodate a host of events, including concerts, ceremonies, exhibitions, conferences and sports events. It is the latest addition to City Walk, an outdoor retail and entertainment complex on the Dubai seafront. Buro Happold's engineers were engaged in a review role for structural and facade engineering. Our involvement resulted in saving of 1,400 tonnes of steelwork and \$4m.





# STADIA

A stadium is among the most valuable assets that a football club possesses. An emblem of the team's past, present and future, the home ground holds memories, emotions and hope. It brings communities together.

Developing a stadium can create huge benefits for all stakeholders, from the club and players to the fans, local residents and businesses. It can be a catalyst for wider renewal, economic growth and improved infrastructure while attracting investment from further afield.

Construction of a new stadium is a once-in-a-generation opportunity to get it right. Spectators and athletes demand an environment that not only allows for optimal comfort and performance but also provides an unforgettable experience. Business owners and managers need the venue to perform and deliver a return on investment. Buro Happold knows what it takes to create remarkable stadia that exceed all expectations.

We are industry leaders in this sector, bolstering our sport venue knowledge with expertise from other disciplines such as airport terminals and entertainment

facilities. Our solution for Doha's Education City Stadium uses 20% less energy than the original design and will deliver better comfort for the spectators at the 2022 FIFA World Cup; our holistic engineering design — including the complete structural system — saved 40% in construction costs. The sophisticated retractable roof system for Atlanta's Mercedes-Benz Stadium allows play to take place in outdoor and covered environments; the theatrics of the roof opening captivates fans and enhances the brand value of both the Atlanta Falcons and Atlanta United FC. The state-of-the-art retractable pitch at Tottenham Hotspur's new stadium allows for multipurpose usage and will result in substantial additional revenue.

Yes, a new stadium can have a huge impact on the revenue, reputation and results of a club. Buro Happold helps clients to exploit the opportunities and make it happen.







“We all feel the same, so excited. I got the same feeling when we left White Hart Lane on the last day we were crying... now, in the first day, in the new stadium, we feel the same emotion.

We need to cry because our dream became true.”

Mauricio Pochettino,  
Manager, Tottenham Hotspur



STADIA

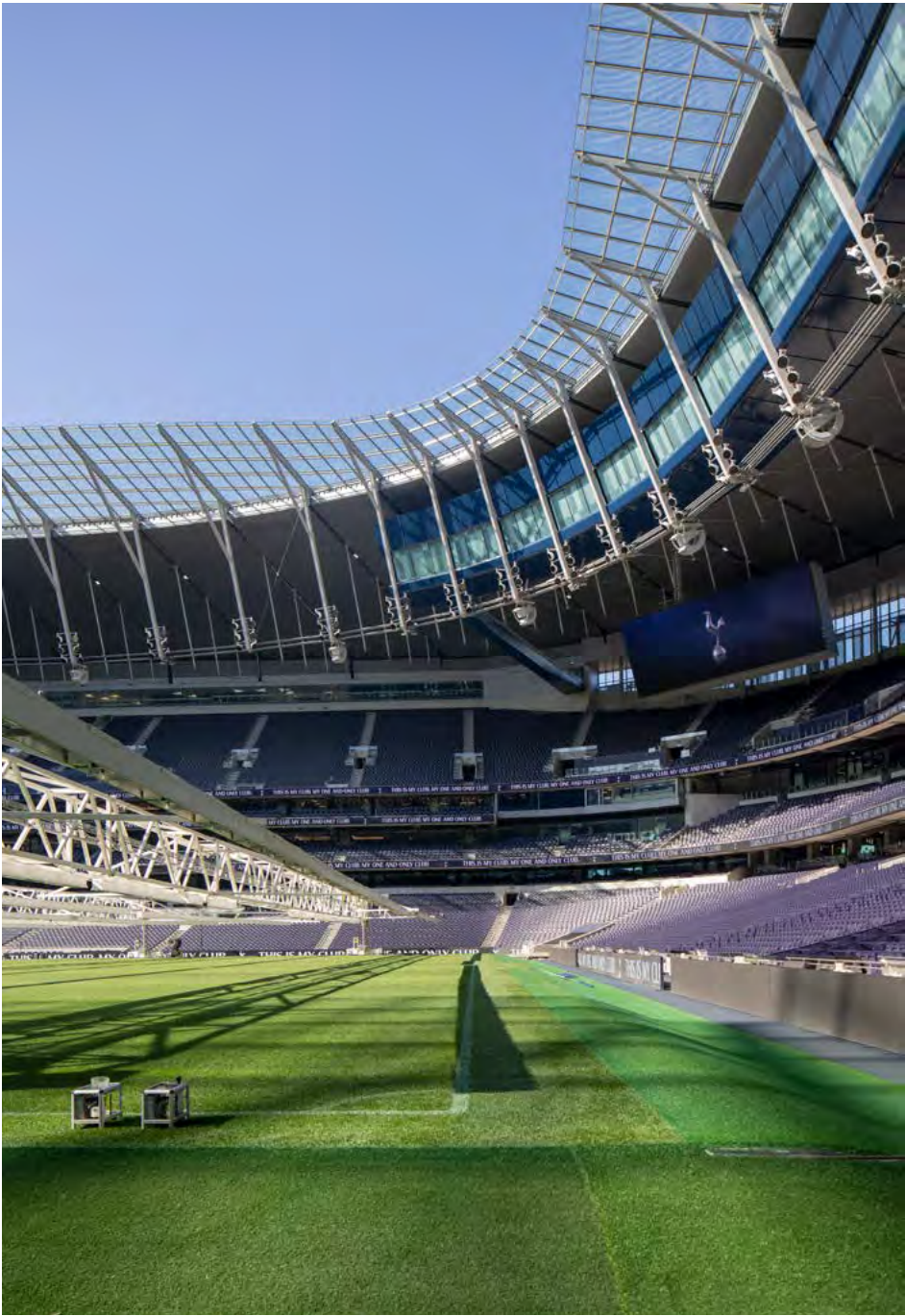
Providing an exceptional fan experience, the new Tottenham Hotspur stadium is a precise realisation of the club's vision. Successful construction of this landmark venue has been made possible by our team's determination to overcome a series of challenges while maintaining design intent. Tottenham's aspiration for the project was simple – to be the best. Not just the best in north London or the English Premier League. No, this had to be Europe's number one venue for playing and enjoying football.



STADIA



The plan was not only to position fans as close to the pitch as possible but also increase capacity from approximately 36,000 to over 62,000. Another key objective was to bring the NFL to north London by incorporating an uncompromised American Football capability. Crucial to Buro Happold's contribution has been engineering innovation and the use of long span structures. Such ingenuity included eliminating 40% of the columns to provide open concourses and hospitality spaces. We also managed to slide a 70m x 110m turf pitch under 17,500 people while controlling the structural dynamics.

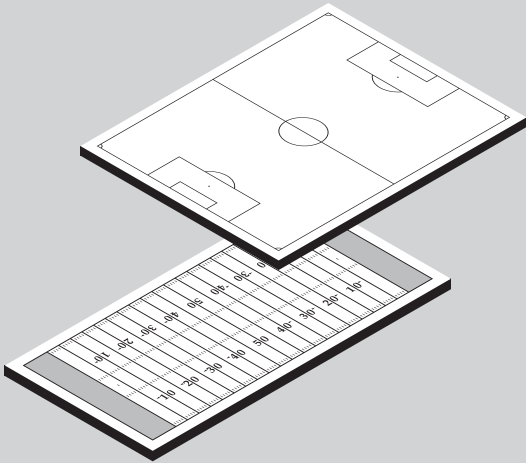




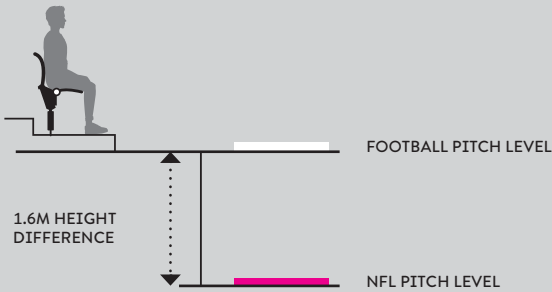
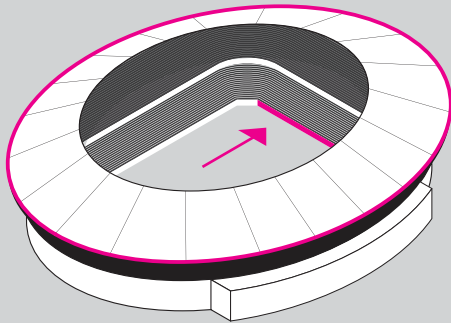


The sliding pitch is the first in the world to have a full grass surface that splits into three parts before rolling away beneath the stands. When NFL games are hosted at a typical football ground, players standing on the sidelines obstruct spectator views from the lower rows so hundreds of seats cannot be sold. This is not a problem at Tottenham, where a dedicated NFL surface under the retractable pitch sits 1.6m below the first row of seating. As well as providing optimum sightlines, the seating capacity is identical for football and NFL games. The entire “pitch switching” process takes just 25 minutes.

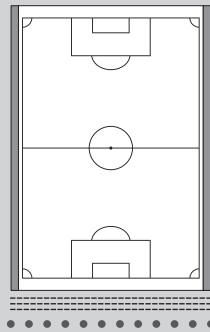
THE PROJECT REQUIRED TWO DEDICATED PITCHES, ONE FOR FOOTBALL AND THE OTHER FOR NFL



THE RETRACTABLE PITCH NEEDED TO BE STORED UNDER THE SOUTH STAND

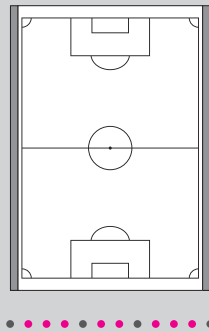


1



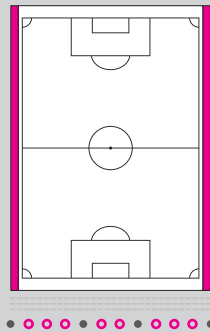
Football pitch in match day position

2



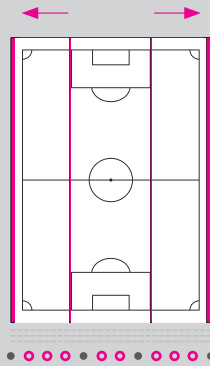
Front three rows of seating removed to provide sufficient depth for pitch to slide below. Retractable feet retract.

3



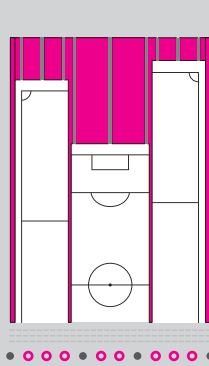
Pitch edges drop to allow space around perimeter for lateral slide

4



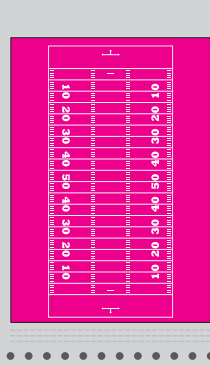
Outer sections of pitch slide laterally to divide pitch into three sections

5

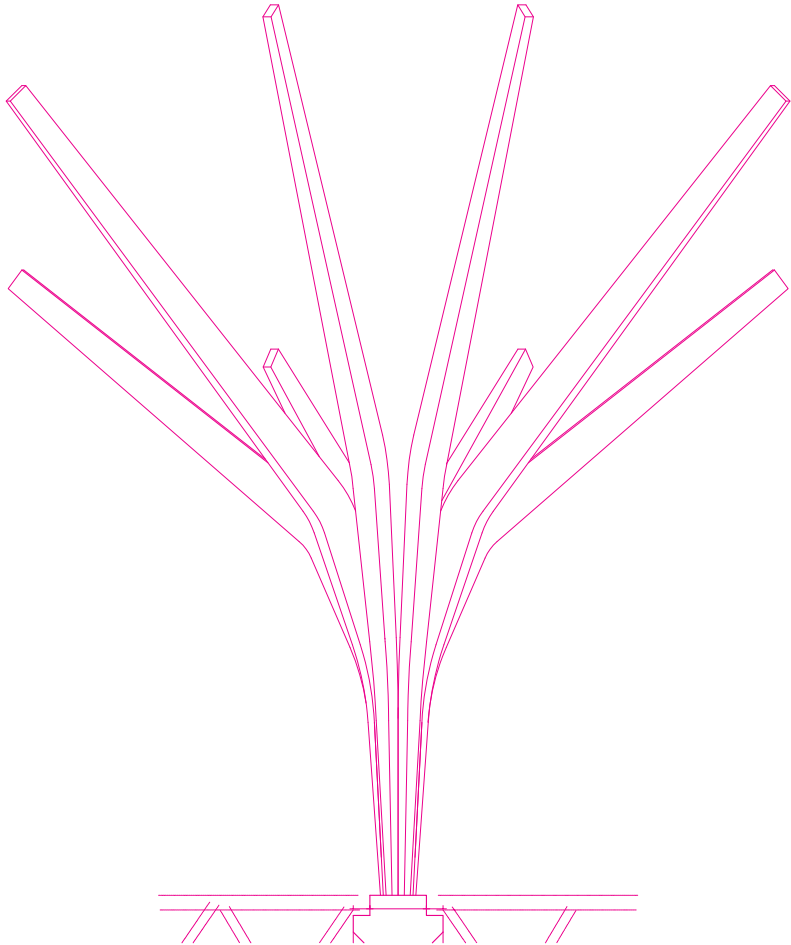


Pitch slides longitudinally beneath South Stand

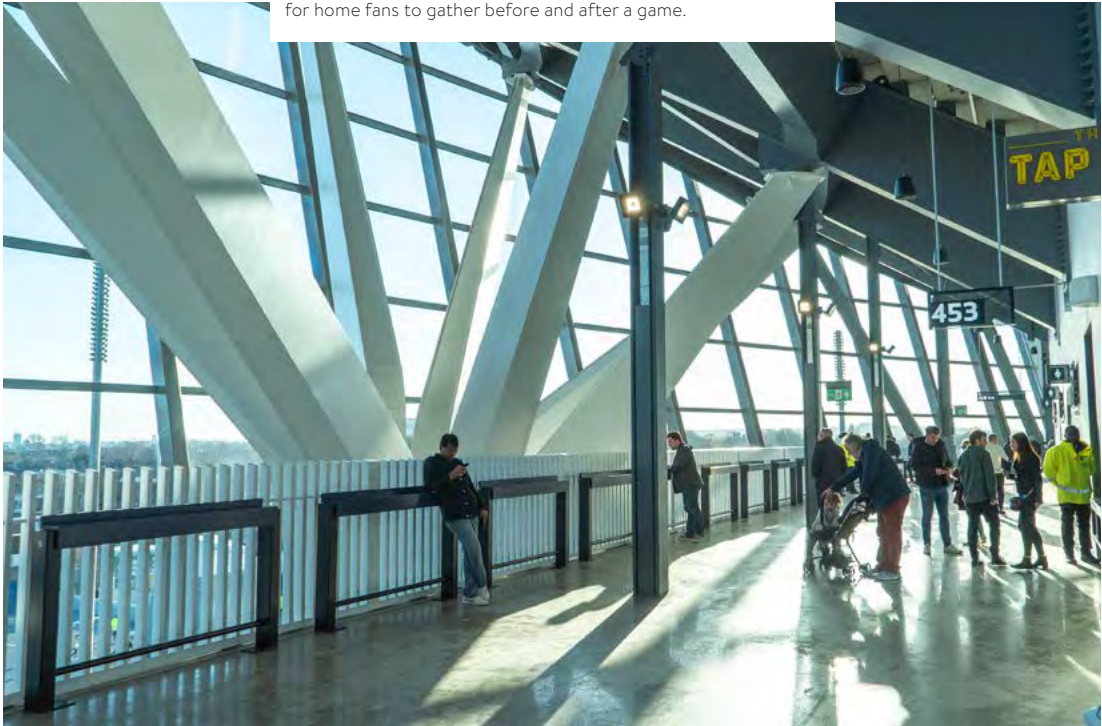
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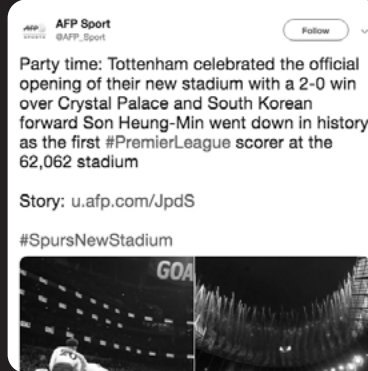
Pitch stored beneath South Stand. Retractable feet redeployed



A pair of vast “trees” provides an elegant solution for transferring the huge loads associated with the single-tier South Stand over the sliding pitch below. The main entrance remains uncluttered beneath the spreading “branches”, creating an expansive space for home fans to gather before and after a game.

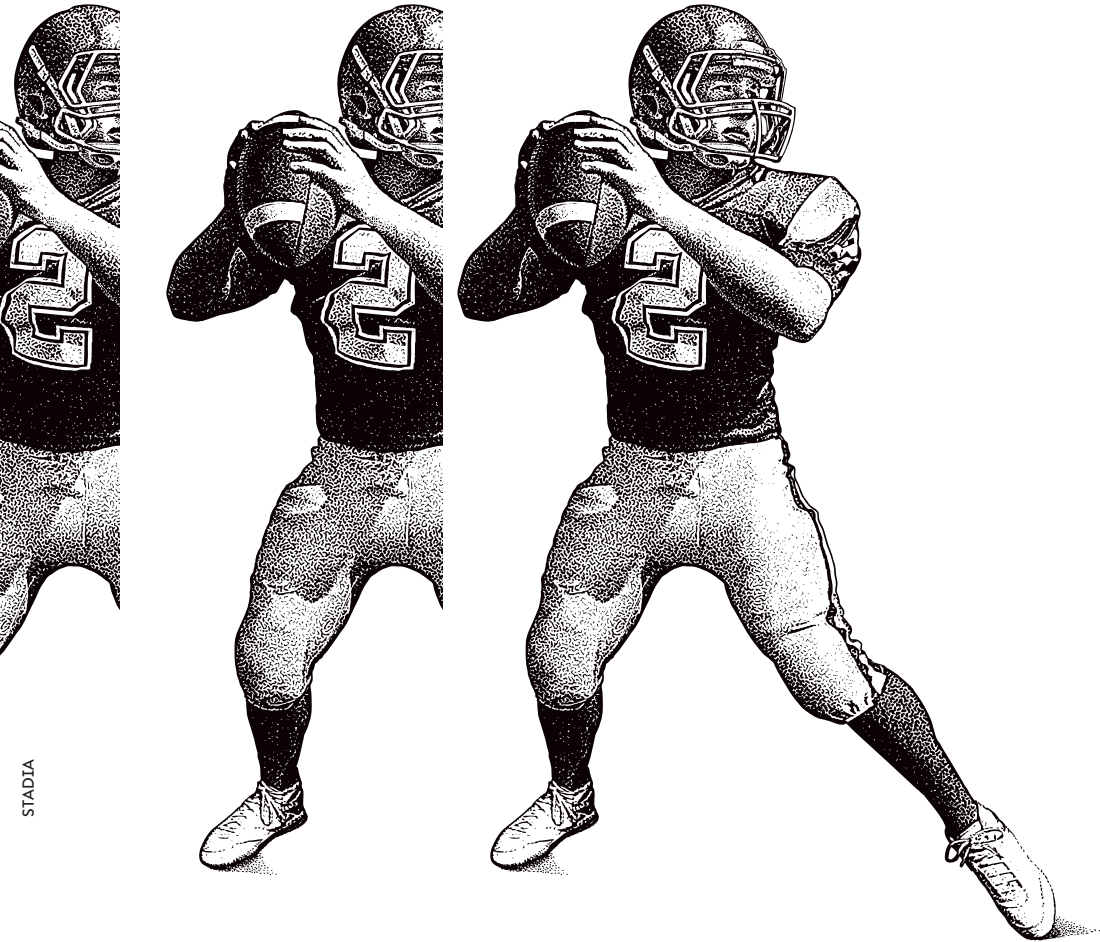




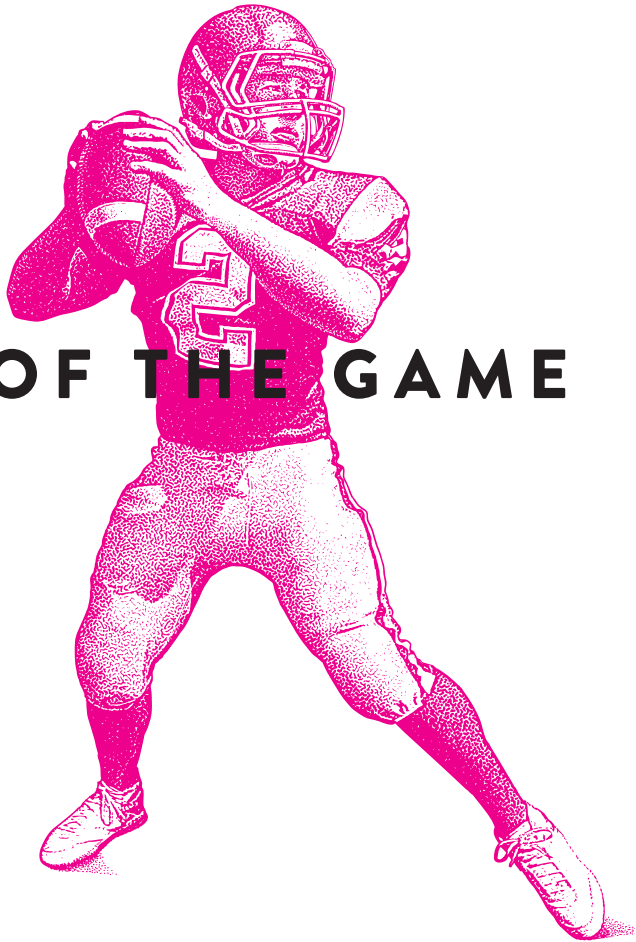


STADIA

STADIA



AHEAD OF THE GAME



STADIA

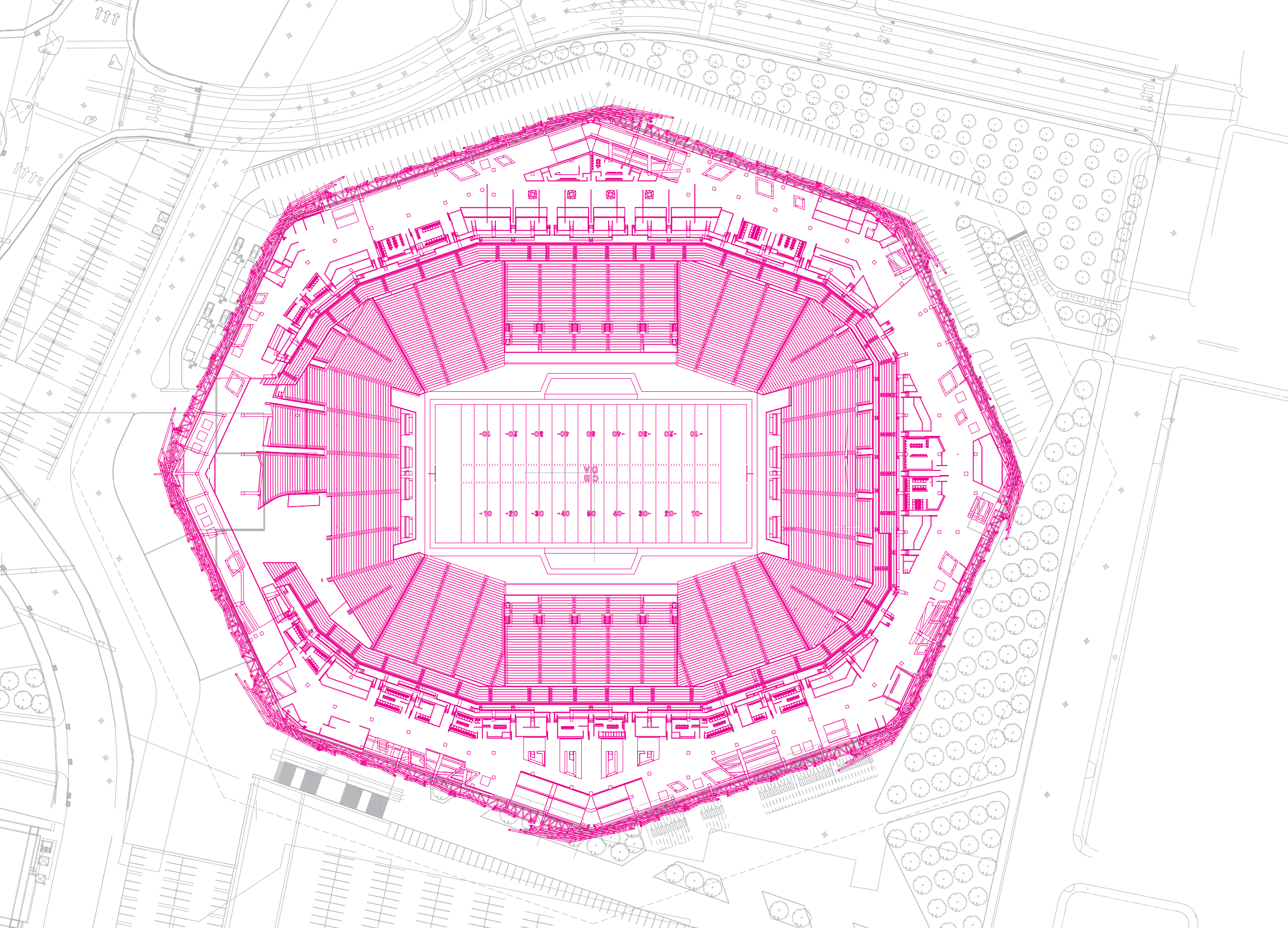
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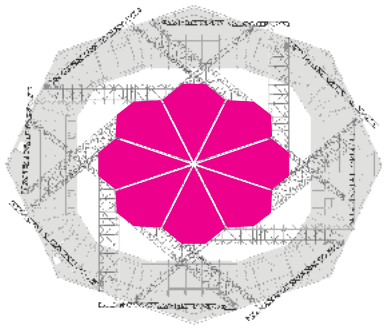


Opened in 2017, the Mercedes-Benz Stadium is home to NFL team the Atlanta Falcons and MLS franchise Atlanta United. As well as featuring advanced sustainable design, the stadium is crowned with an innovative operable roof. This retractable roof can open in 10 minutes or less by moving eight cantilevered “petals” to create a dazzling pinwheel effect. This effect is achieved via a design that uses ETFE cushions – a transparent, inflated lightweight material – that exert minimal weight on the long span cantilevered moving petals. When the petals slide open, the oval-shaped opening spans the length of the field beyond each end zone.



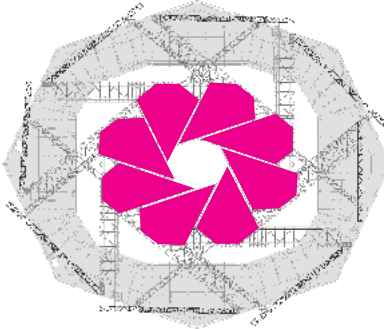






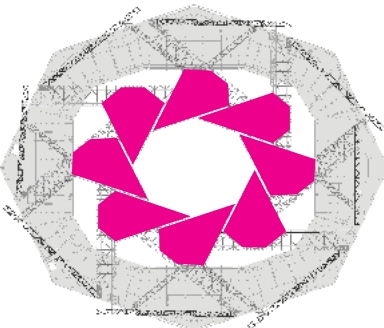
**CLOSED**

When fully closed, the petals cantilever approximately 204ft inwards, simultaneously exerting download and uplift forces on the supporting steel structure.



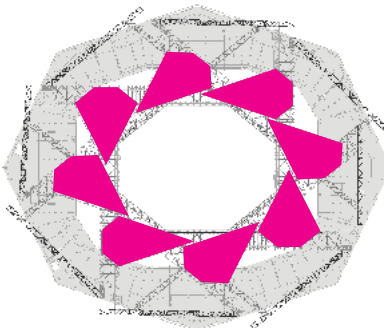
**1/3 OPEN**

Each petal moves on two sets of “bogies” or carriages set on rails as part of a traction-drive system that relies on counterweights. Each rail contains eight gravity bogies and six uplift bogies.



**2/3 OPEN**

While the petals may appear to rotate as the oculus opens, this is in fact an optical illusion. Instead, they move on tracks in a straight line of up to 240ft.



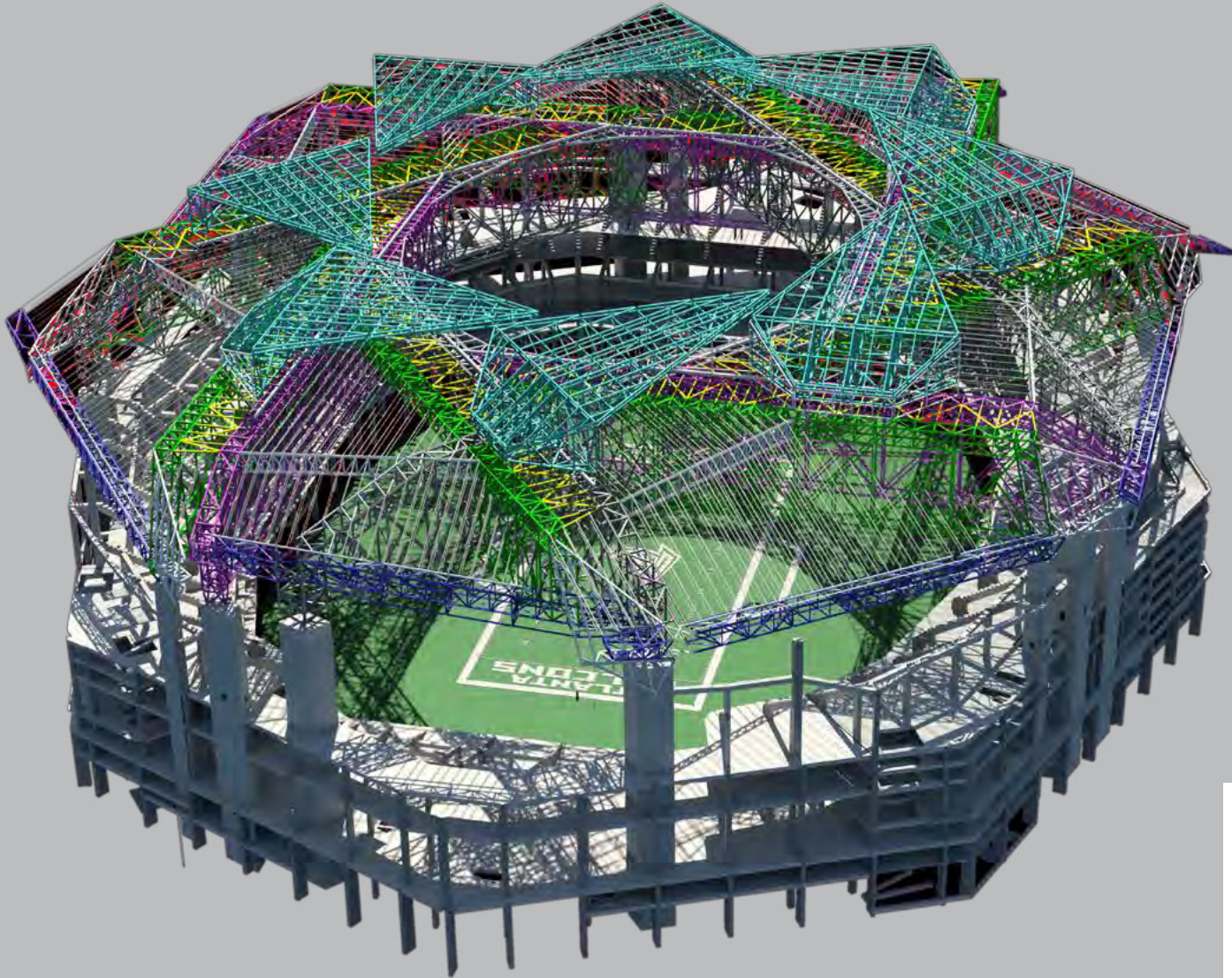
**OPEN**

The steel-framed petals range from 196ft to 232ft in length, and each has a 40ft back span. The oculus measures 360ft x 242ft and reaches beyond each end zone.

Inspired by the oculus of the Roman Pantheon and lined with the world's first 360° halo scoreboard, the spectacular roof defines this stadium. We used advanced 3D modelling to work with the wider project team, developing an integrated design that realised the longest two-way spanning roof in the United States.







**37,000**

JOINTS ANALYSED

**15,550**

STEEL MEMBERS ANALYSED

**15,000**

LOAD COMBINATIONS CALCULATED

It took intelligence, tenacity and a unique understanding of the most advanced 3D modelling technology to deliver this iconic stadium. We pushed the parameters of BIM to create a digital environment in which engineers from across our international offices could collaborate with the wider project team. This proved particularly beneficial in developing the complex structural steel framework that supports the stadium's signature oculus roof. By inviting the steel fabricators to collaborate with us in a Tekla virtual model, we were able to develop, integrate and approve almost 100,000 components to deliver an elegant and efficient final design.

Designing in BIM allowed us to develop much more than just a 3D model of the steel framework — this approach enabled us to ensure that our pioneering designs were buildable, cost-efficient and sustainable. Within each component of the steel structure, we were able to embed additional information specific to the further dimensions of time (4D), cost (5D), sustainability (6D), and facility management (7D). We used all seven dimensions to coordinate our development of the steel framework with that of the architectural and MEP design. This produced clear construction costings and schedules that achieved tangible benefits for both the team and our client.



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#### WEST END STADIUM, OHIO, USA

Scheduled to open in March 2021, the new 26,000 capacity soccer-specific stadium will be the home of FC Cincinnati. Taking this Major League Soccer team's goal of creating an iconic and groundbreaking design for the city while prioritising and amplifying the fan experience, this unique stadium will be among the world's most distinctive sporting venues.

57

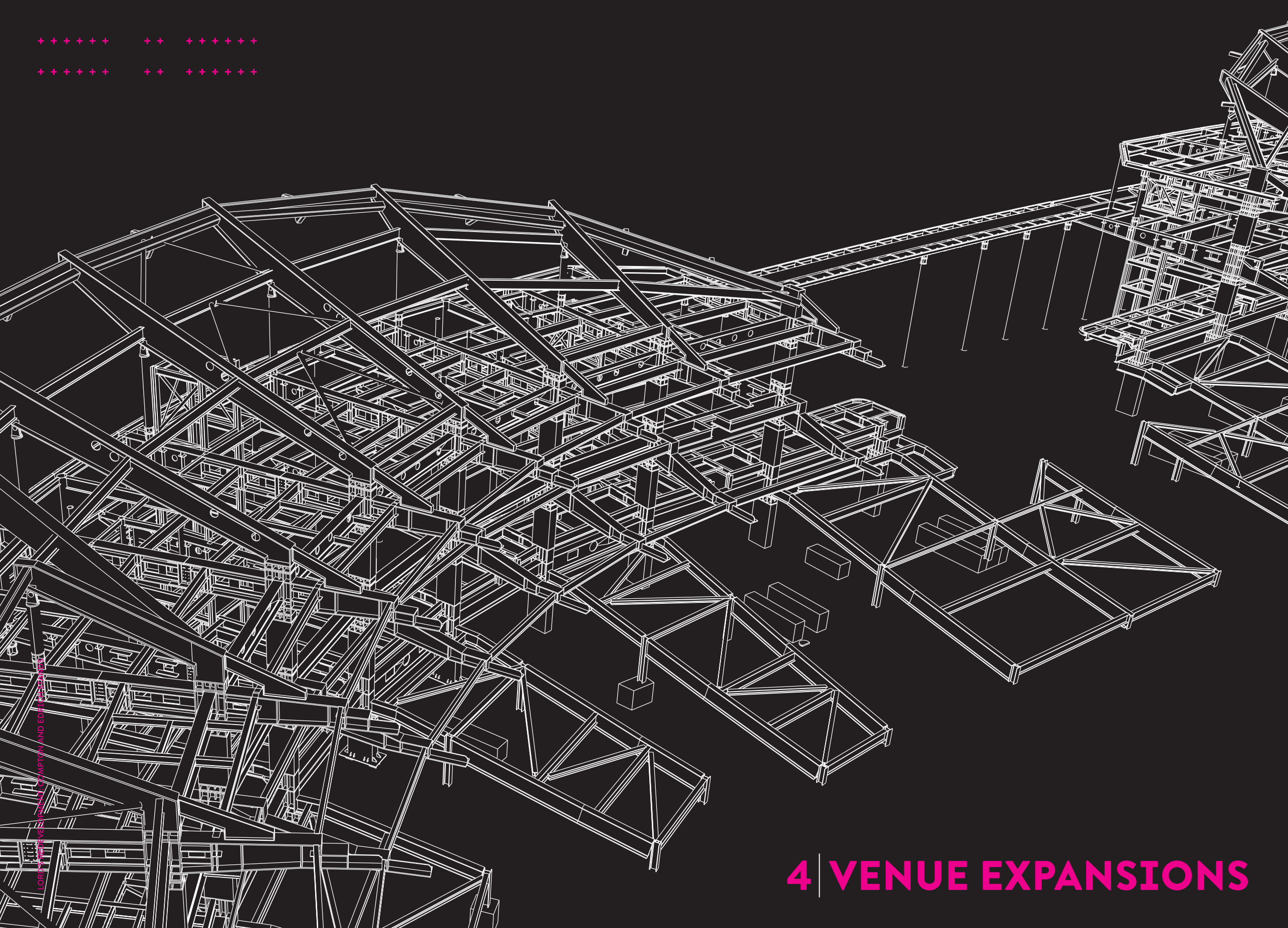


#### EDUCATION CITY STADIUM, DOHA, QATAR

The 40,000-seat stadium will be one of the primary venues when Qatar hosts the 2022 FIFA World Cup. Enclosed in an outer shell shaped to resemble a diamond, the stadium glints as it catches the sun, and glitters under the illumination of thousands of diodes at night. Our engineering design features an innovative bowl cooling system and pioneering cable roof structure that will deliver an exceptional spectator experience.



+++++ ++ ++++++  
+++++ ++ ++++++



LORI VESTER, ARCHITECT, CAMPION AND EDWARDS LLP

## 4 | VENUE EXPANSIONS



# VENUE EXPANSIONS

Phased developments are often the most feasible way for a client to realise their ambitions. Expansion or refurbishment of existing assets can make a significant contribution to achieving success both on and off the field.

From single stand augmentation to major renovations, Buro Happold helps clubs to secure returns from investments and improve performance. We have delivered venue expansions — while maintaining operational continuity — all over the world. For each, we have endeavoured to discern exactly what the developer and operator want to achieve from their facility. Existing requirements and aspirations for the future inform solutions based on a detailed understanding of what works most effectively.

Our team is not only fanatical about sport and entertainment but also obsessive about producing better outcomes for clients. We have devised an innovative approach to venue expansion that allows us to scientifically model all aspects of a redeveloped facility, providing technical consultancy advice to ensure compliance. Our specialist engineers work with clients to identify drivers and economic imperatives before designing and delivering a bespoke expansion around defined business needs.





## PUSHING THE BOUNDARIES OF SPECTATOR EXPERIENCE

Established in 1814, Lord's is internationally renowned as the home of cricket. Responding to an increasingly competitive sporting environment, the north-west London ground is undergoing upgrade work to steadily improve facilities in accordance with a staged masterplan. This approach allows continued hosting of matches while increasing operational efficiency to enhance spectator experience. The programme began in 2014 and is scheduled to continue until 2032.

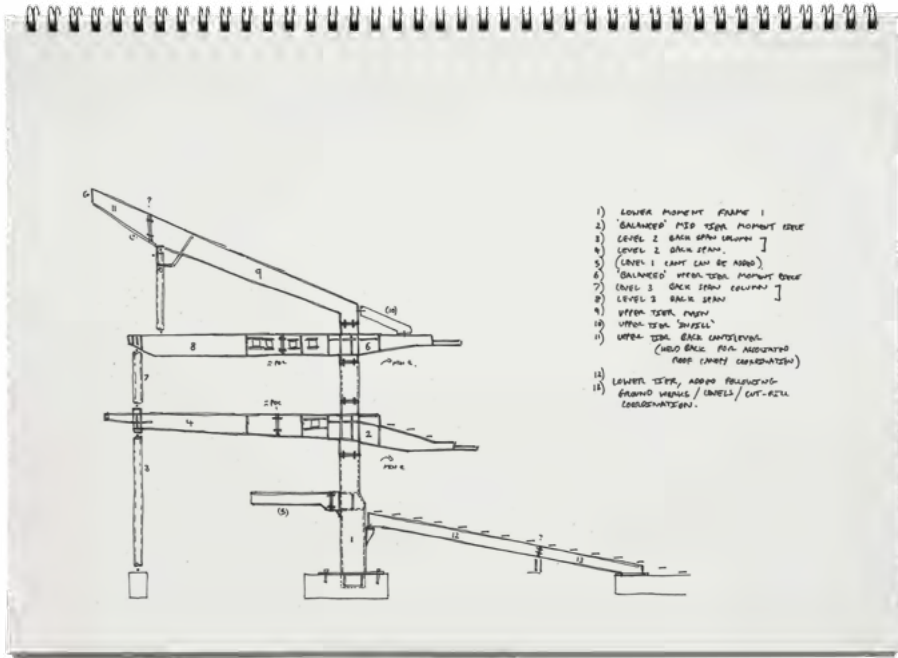
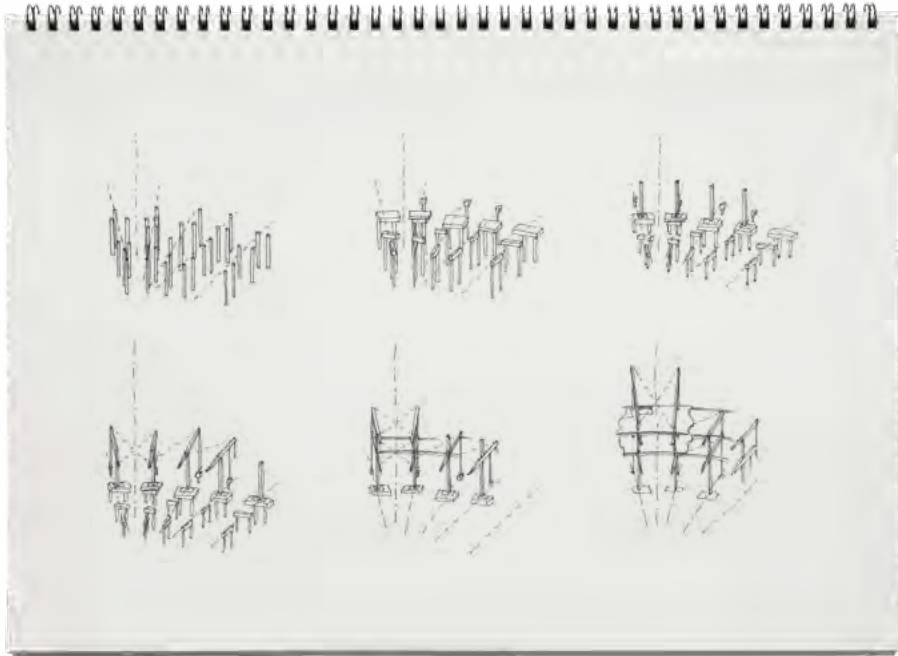
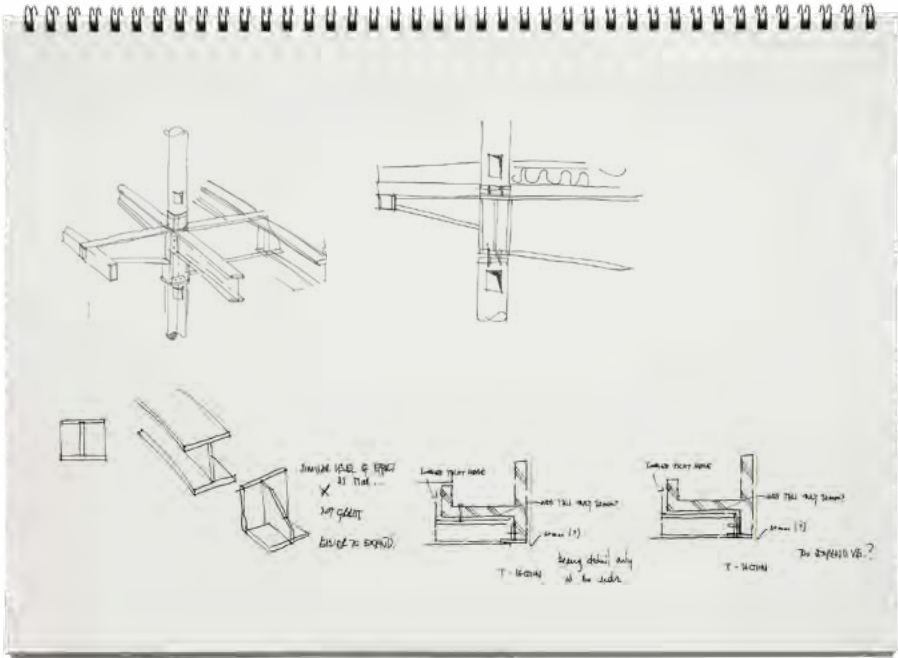
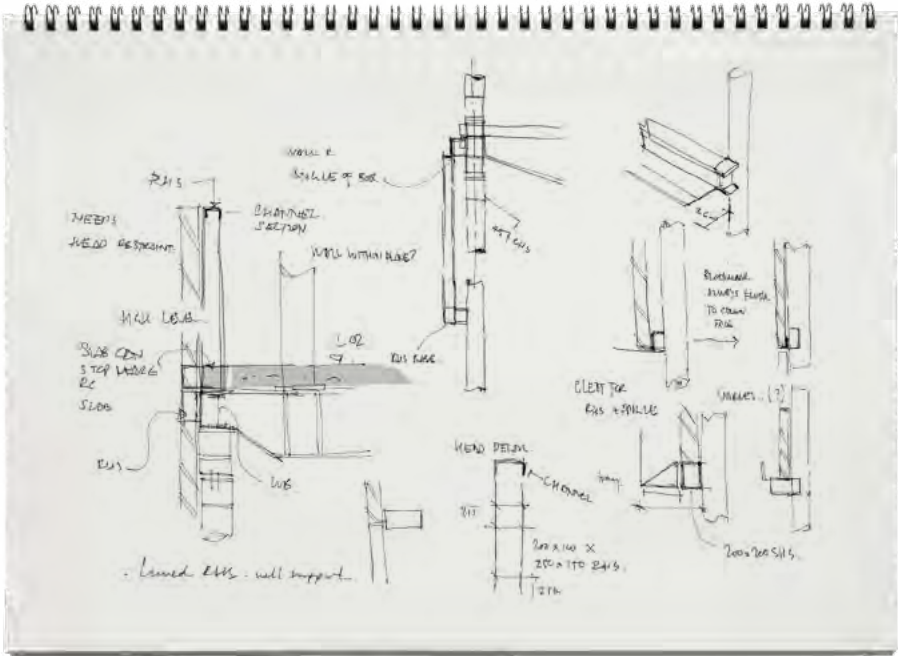




The second phase of the masterplan encompasses redevelopment of the Compton and Edrich stands, which are situated either side of the distinctive aluminium media centre at the famous Nursery End. A three-tier arrangement will take capacity of the new stands from 9,000 to 11,500 seats.

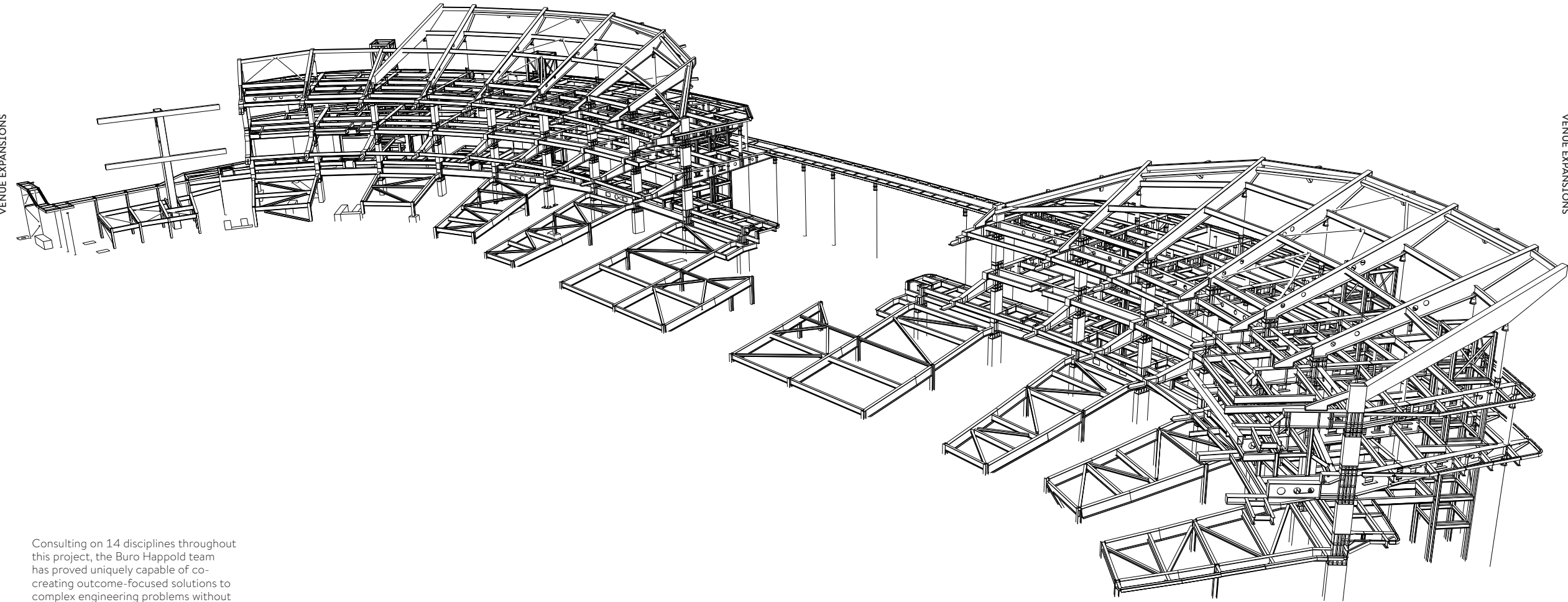
There will also be wheelchair spaces, additional accessible seating and modern associated amenities. Other features include food and beverage concessions, new washrooms and a high-level connecting walkway for improved crowd circulation. Unlike the current stands, the top level will be partially covered.





The MCC requires stands of significant merit that integrate with users and the ground's character throughout execution of the masterplan and beyond. Sketching helped us to reveal potential drawbacks and efficiencies prior to developing the model.



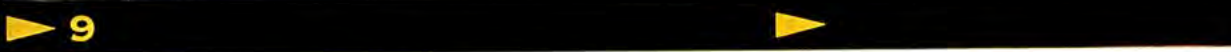


Consulting on 14 disciplines throughout this project, the Buro Happold team has proved uniquely capable of co-creating outcome-focused solutions to complex engineering problems without compromising function or form. By understanding client aspiration for the stands and how this relates to broader venue objectives, Buro Happold's expertise is helping the MCC to ensure that Lord's remains the best place in the world to watch and play cricket.





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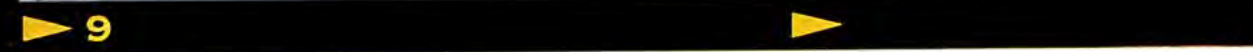


#### SHEIKH ZAYED STADIUM REDEVELOPMENT, ABU DHABI, UAE

In 2008, Abu Dhabi was appointed host for the 2009 FIFA World Club Championships. Having opened in 1980, this venue required extensive refurbishment. The project had to deliver an international standard football pitch and athletics track, with seating for 45,000 spectators. Buro Happold successfully delivered agile design solutions to a tight timescale. The works were completed to exceptional standards of comfort and style, with the first game played at the updated stadium in December 2009.



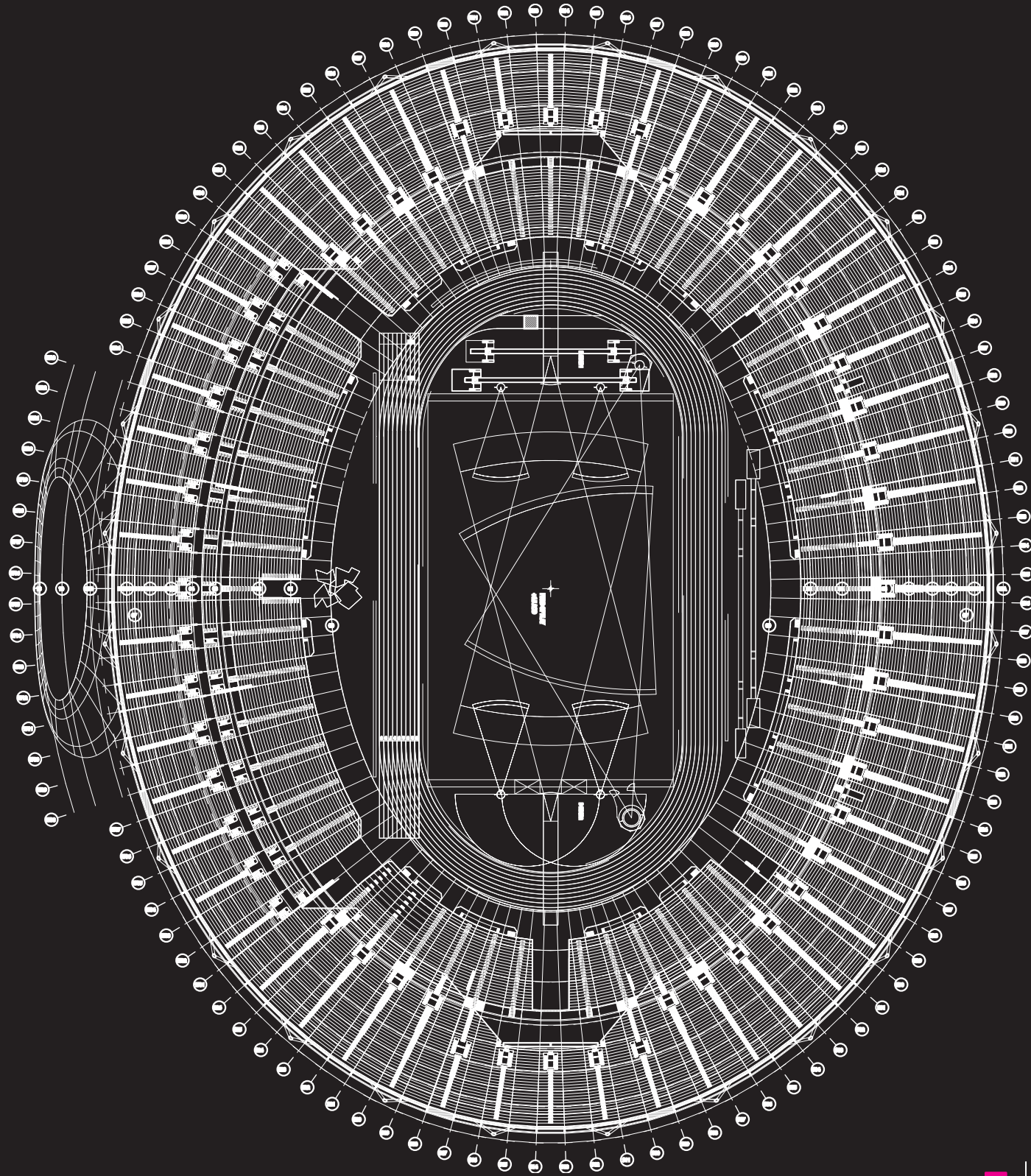
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#### ETIHAD, MANCHESTER CITY FC STADIUM, MANCHESTER, UK

When Manchester City's stadium required expansion to reflect increased demand and stature, the club approached us to achieve the vision. The major challenge was that the Etihad would need to remain open during the works. Our engineers developed an ingenious structural solution that integrated seamlessly with the existing structure, kept the stadium operational and included a complex ground excavation. We successfully delivered the quality stand, access and hospitality that the club needed in order to break new ground and remain competitive at the highest level.







# MAJOR EVENTS

Hosting a successful Olympics, FIFA World Cup or Pan-Asian Games brings great prestige. Such events dramatically elevate a city's profile, boosting local and national pride.

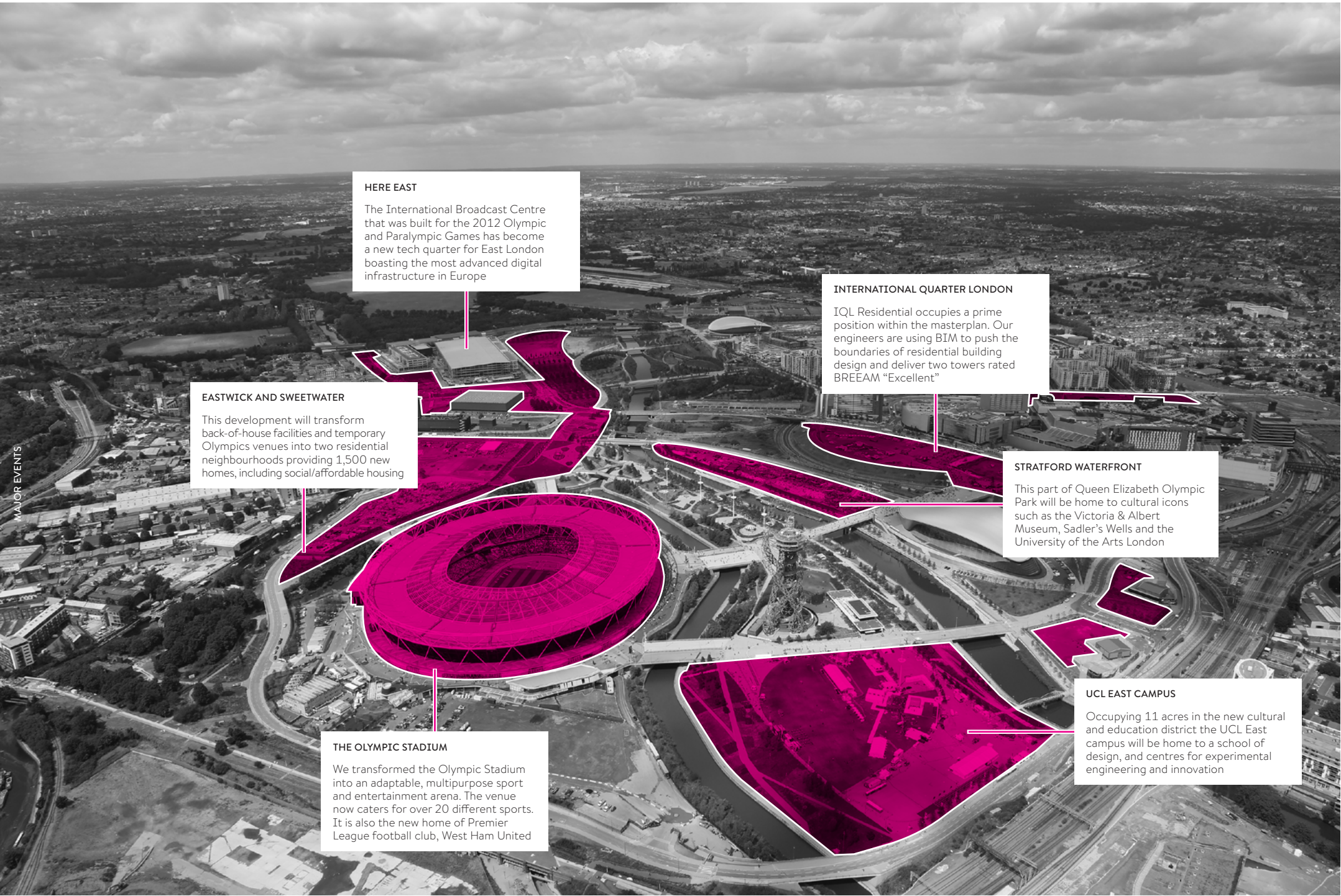
Host status can help to access funding that accelerates the development of much-needed city infrastructure and drives forward regeneration, improving the lives of citizens for years to come. The resulting facilities and capabilities can position the city favourably to hold future competitions, yielding additional income and prosperity. However, hosting a major event is not for the faint-hearted. There is a lot at stake and much can go wrong – these are highly complex and costly programmes to bid for, win and deliver. Then there is the matter of transformation into a legacy state that provides long-term value to the city. The challenge is certainly daunting, which is where Buro Happold comes in.

As part of a team of major events experts, we support cities through the bid and delivery programme. This process includes exploring how hosting could support a client's civic vision and development agenda, assessing the feasibility of a successful bid and guiding the right people through the proposal process. Once the bid is successful, our technical staff can help to deliver the programme from start to finish. This is exactly what we did for the 2012 Summer Olympics and Paralympics, where we transformed a disconnected and contaminated industrial site in London's East End into a wonderful global showcase for the best of the best. Legacy was at the core of this project's immense success.





MAJOR EVENTS



**HERE EAST**

The International Broadcast Centre that was built for the 2012 Olympic and Paralympic Games has become a new tech quarter for East London boasting the most advanced digital infrastructure in Europe

**EASTWICK AND SWEETWATER**

This development will transform back-of-house facilities and temporary Olympics venues into two residential neighbourhoods providing 1,500 new homes, including social/affordable housing

**THE OLYMPIC STADIUM**

We transformed the Olympic Stadium into an adaptable, multipurpose sport and entertainment arena. The venue now caters for over 20 different sports. It is also the new home of Premier League football club, West Ham United

**INTERNATIONAL QUARTER LONDON**

IQL Residential occupies a prime position within the masterplan. Our engineers are using BIM to push the boundaries of residential building design and deliver two towers rated BREEAM "Excellent"

**STRATFORD WATERFRONT**

This part of Queen Elizabeth Olympic Park will be home to cultural icons such as the Victoria & Albert Museum, Sadler's Wells and the University of the Arts London

**UCL EAST CAMPUS**

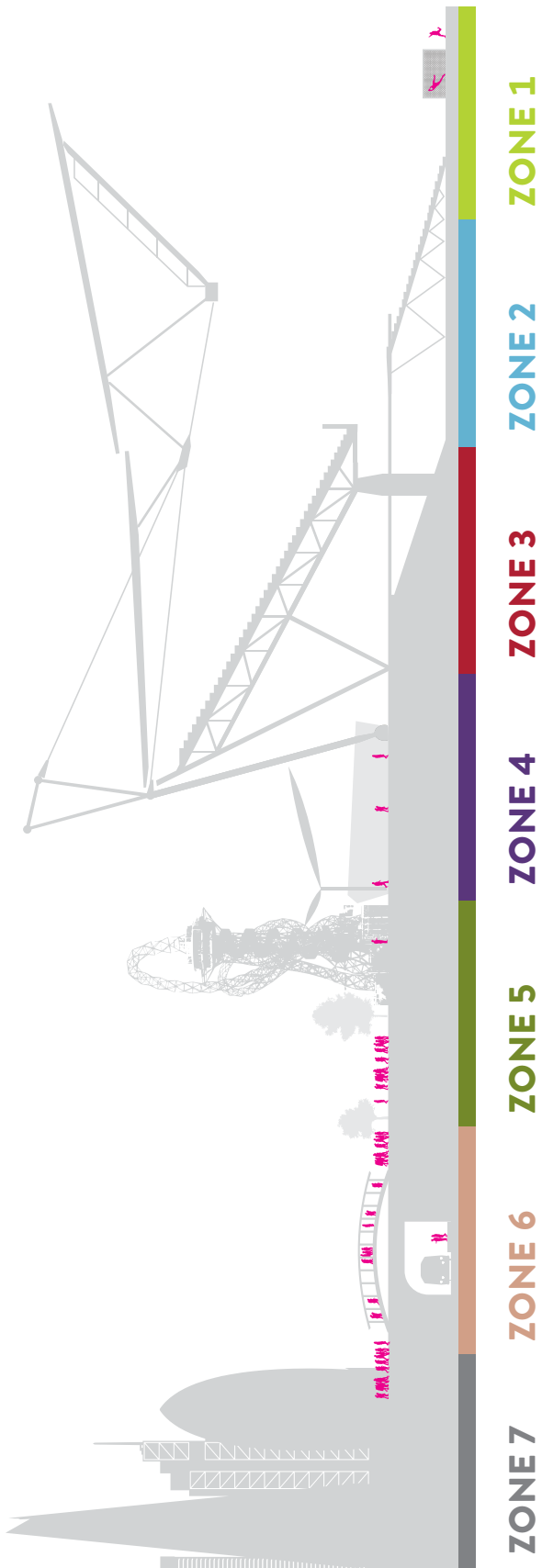
Occupying 11 acres in the new cultural and education district the UCL East campus will be home to a school of design, and centres for experimental engineering and innovation

MAJOR EVENTS

In 2003, Buro Happold was appointed as the principal engineer for the AECOM consortium. This consortium was selected to masterplan the transformation of Lower Lea Valley — which was one of Europe's most deprived areas — into the site of the London 2012 Olympic and Paralympic Games, while also developing the masterplan for the site's future legacy. We have played a major role in this extremely complex East London regeneration project ever since.



# ZONING OF STADIUM SERVICES



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## ZONE 7

### CITY/COMMUNITY

- Net positive socioeconomic impact on the community, including catalysts for further development
- Improved infrastructure and multimodal public realm
- Related health and wellbeing benefits
- Commercial and talent development with benefits of wider engagement

## ZONE 6

### TRANSPORT HUB

- Multimodal efficient and safe transfer of crowds from one mode of transport to another
- Provision of transport infrastructure and associated support facilities
- An opportunity to create a destination rather than just part of the journey

## ZONE 5

### OPEN SPACE

- Efficient and safe multimodal space for pedestrian circulation and venue servicing
- Interface with other modes of transport including car parking
- Opportunity for social and economic development in event and non-event modes
- Contextual transition zone between large venue and wider community

## ZONE 4

### CIRCULATION AREA

- User safety and compliance
- Environmental regulation to internal/outdoor spaces
- Acoustic performance regulation
- Effective wayfinding and circulation
- Security demarcation
- Architectural expression

## ZONE 3

### INTERNAL CONCOURSE

- User safety and compliance
- Provision of accommodation and circulation space
- Efficient semi-internal event support facilities
- Internal flexible facilities for event support enhanced facilities (corporate, dining)
- Internal facilities provided for performer support
- Internal facilities provided for event management

## ZONE 2

### SPECTATOR ZONE

- Environmental regulation
- Support to high-level services
- Acoustic performance regulation
- Architectural expression
- Clarity and proximity of FOP image for TV/spectators
- Spectator safety and compliance
- Variety of products to suit stakeholder needs
- Stimulating atmosphere

## ZONE 1

### FIELD OF PLAY

- Environmental conditions for performance (natural and enhanced conditions)
- Sports performance surface
- Stimulating atmosphere
- Clarity of FOP image for TV





“We lit the flame and we lit up the world... thank you to the people who built the stadiums, the people who created a new neighbourhood in an old city... when our time came, Britain, we did it right.”

Lord Coe, London Olympics closing ceremony, 12 August 2012



# OUR OFFICES

Buro Happold expertise around the world.

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